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Surgery for esophageal adenocarcinoma: three field open McKeown procedure has a role in assessment and treatment of extensive locally advanced esophageal adenocarcinoma with a favorable clinical and pathological outcome

Abstract

Esophageal adenocarcinoma has seen increased incidence due to gastroesophageal reflux disease, smoking, and obesity. There are no established guidelines for screening of esophageal cancer and many patients present late in their disease process. Most early stage adenocarcinoma of the esophagus is treated with neoadjuvant chemotherapy and radiation, followed by surgical resection. We describe a case of locally advanced esophageal cancer where the patient had a relatively insignificant response to neoadjuvant chemotherapy and radiation, who was then treated by open direct resection of the esophagus and proximal stomach (three field McKeown approach) with lymphadenectomy. There were no surgical complications such as anstomotic leak or chylothorax. Pathology showed T2N0 disease.

The mainstay of esophageal resection continues to be minimally invasive procedures for early stage esophageal malignancy; however, locally advanced esophageal cancer in the mediastinum occasionally requires an open direct approach. We felt that this was a necessary procedure due to the large mass effect of the tumor, and a preoperative staging of T2N3. In this case, despite recent advancements, there was a limited response of the cancer to neoinduction therapy. Surgery was necessary to both assess and treat this cancer, proving that older, established therapy is still relevant.

Keywords

esophageal adenocarcinoma, McKeown esophagectomy, mediastinal mass

Introduction

Esophageal cancer treatment has been standardized in recent years. Usual practice is now neoadjuvant chemotherapy and radiation followed by surgery in suitable patients.[1] The initial operation for esophageal cancer resection was an Ivor Lewis procedure (laparotomy and right thoracotomy). More recently, transhiatal esophagectomy (laparotomy and left neck dissection) was described by Orringer at the University of Michigan. The three field Mckeown procedure is a combination of these two procedures utilizing a right thoracotomy, laparotomy, and left neck dissection. This allows the dissection to be completed under direct visualization in the right chest, combined with a left neck anastomosis.

We describe a case of esophageal adenocarcinoma that involved a significant length of the esophagus. After chemotherapy and radiation, with restaging by PET scan, the patient underwent a three field esophagectomy and lymph node dissection. This allowed dissection of the significant mass effect with possible locally advanced disease to be done under direct visualization and allowed an esophagogastric anastomosis in the neck.

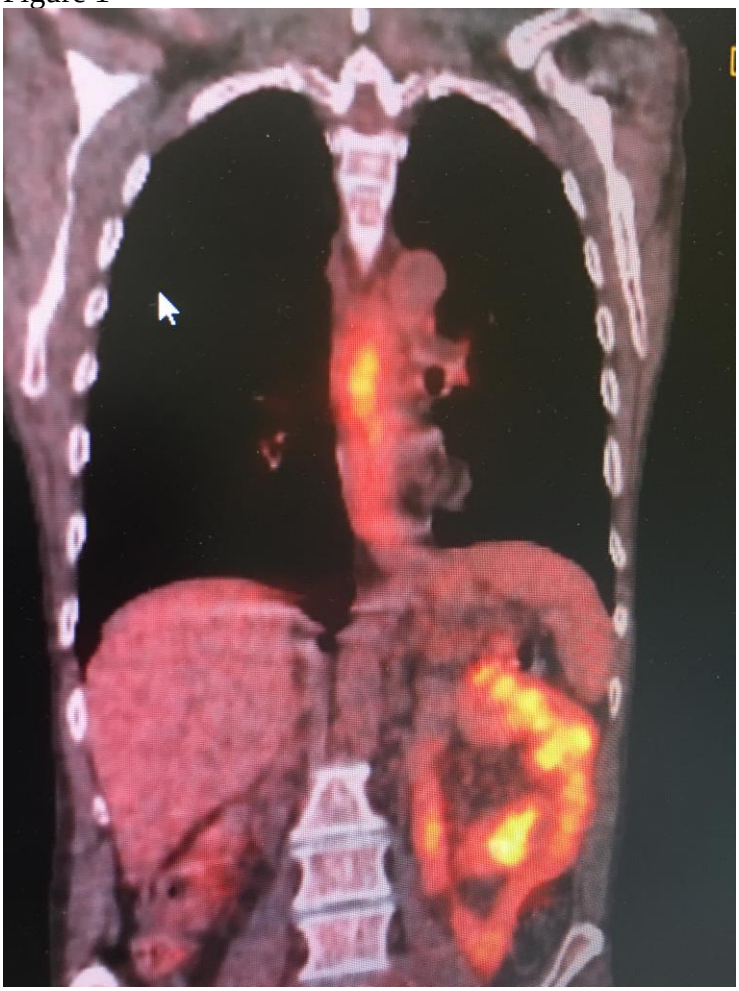
Case report

A 64 year old white male was referred to our institution with esophageal adenocarcinoma. He had a history of heavy alcohol and tobacco use as well as gastroesophageal reflux, and was hepatitis A, B and C positive. He had undergone a exploratory laparotomy in the past for blunt trauma, and had symptoms of dysphagia and weight loss. He was evaluated by endoscopy and endoscopic ultrasound; that showed a T2N3 tumor. PET scan showed a localized tumor in the mediastinum with significant mass effect and questionable invasion into the surrounding tissues.

Treatment comprised of initial laparotomy and feeding jejunostomy placement for tube feeds, followed by concurrent neoadjuvant chemoradiation. The patient received 50Gy in 23 fractions, carboplatin AUC 2, and

paclitaxel 50 mg/m2 chemotherapy over five weeks (Figure 1). A repeat PET scan showed little regression of the tumor and sustained significant mass effect in the distal esophagus that extended proximally. There was no nodal spread or distant metastatic disease. Endoscopy showed no intraluminal disease and proximal gastric biopsies were negative for cancer.

Figure 1



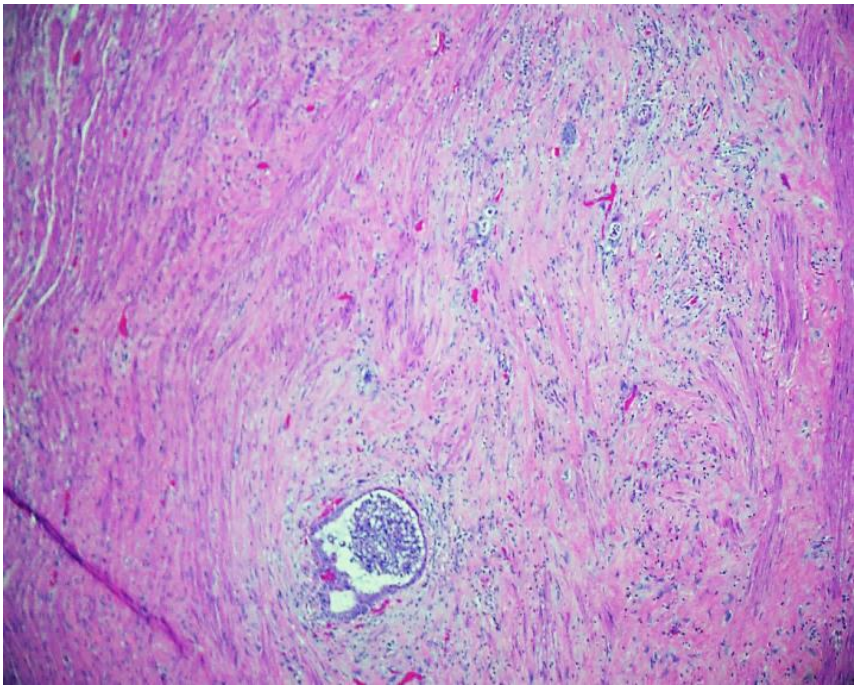
Coronal images of preoperative PET-CT scan on patient with esophageal cancer. Patient had been treated with concurrent neoadjuvant chemoradiation. Patient received 50Gy in 23 fractions and also carboplatin AUC and paclitaxel for a five week period. Patient scheduled for three field esophagectomy.

The patient underwent bronchoscopy and right thoracotomy with complete mobilization of the intrathoracic esophagus, mediastinal lymph node dissection, and ligation of the thoracic duct. Chest tubes were placed and laparotomy was performed with lysis of adhesions and gastric mobilization on the right gastroepiploic artery, and a duodenal kocher maneuver. A left neck dissection was carried out to identifiy the esophagus in the neck. The stomach was transected in the abdomen and the distal remnant was clearly able to reach to the neck. The proximal stomach and esophagus were pulled up from the neck with the new gastric conduit following close behind. In the neck, the esophagus was trensected and the specimen of esophagus and proximal stomach removed. Frozen sections of the specimen showed clear margins. The distal gastric conduit was anastomosed to the proximal esophagus using a stapling technique. A nasogastric tube was placed throught the esophagogastric anastomosis prior to its completion. The patient was extubated in the operating room and went to the recovery room in stable condition.

He required intubation on the fourth postoperative day for mucous plugging; bronchoscopy was required. After extubation he underwent a swallow study that showed no anastomotic leak. He was commenced on clear liquids but required reintubation for presumed aspiration and pseudomonas pneumonia for which

antibiotics were started. Bronchoscopy cleared his airway, and he was extubated. His drains and chest tubes were removed and he was moved to the ICU. ENT examination of his vocal cords showed normal movement. Due to issues with secretion management and pneumonia, a bedside percutaneous tracheostomy was performed. He was finally started on a clear liquid diet and transferred to an acute skilled nursing facility. Final pathology showed T2N0 disease with clear margins and excised nodes negative (Figure 2).

Figure 2



Histopathology of the resected specimen. Hematoxylin and eosin stain shows invasive adenocarcinoma in the muscularis propria of the esophageal wall. Final Pathology was a stage T2N0M0. Preoperative studies showed a bulky mediastinal mass and a T2N3M0 staging.

Discussion

Data supporting the treatment of esophageal cancer in patients deemed to be surgically operable is documented in clinical trials. Results from the CROSS trial have shown that induction neoadjuvant chemoradiation treatment followed by surgery show improved outcomes compared to surgical treatment alone.[1] There is a 29% complete response in patients undergoing chemoradiation followed by surgery. Median survival in the chemoradiation surgery group was 49 months versus 24 months in the surgery group. For patients who do not have a positive response to initial chemoradiation treatment, such as our patient, the choice of operation becomes more significant. Based on these data and PET scan results, we considered the direct operative assessment under direct visualization to be important in this overall surgical process. The patient underwent a right thoracotomy and direct mobilization of the tumor from the mediastinum, and lymph node dissection. We completed the operation with a neck anastomosis, allowing access to the esophagogastric anastomosis should potential complications arise.

With improvements in robotic technology, esophagectomy is now performed in fewer centers, and a similar oncologic operation is performed in a fashion providing less morbidity, less overall pain, and quicker recovery for the patients. Minimally invasive techniques range from the Ivor lewis procedure to transhiatal esophagectomy; however, open procedures may occasionally be necessary to provide an alternative approach. In the present study, the patient had mediastinal disease that was marginally responsive to induction chemoradiation therapy. An assessment of the tumor location and invasiveness into surrounding mediastinal tissue by direct palpation and dissection under direct visualization was required in order to establish resectability with good surgical margins, safe dissection from surrounding mediastinal tissues, and

removal of all tumor and associated lymph node stations. The final pathological diagnosis in our patient was adenocarcinoma and T2N0 disease. The clinical staging of the patient was T2N3 disease based on the PET scan and the endoscopic ultrasound.

Esophagectomy encompasses a variety of procedures and treatment algorithms and has become prevalent in centers where there is significant infrastructure to accomodate the complexity of the treatment regimen and operative and post operative support. Marshall Health continues to adapt to the challenges of the changing landscape in the management of esophageal malignancy.

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